

CLAIMS

What is claimed is:

- 1 1. An actuator, comprising:
2 a stationary guide;
3 a carriage movable along the guide; and
4 a piezoelectric motor operatively coupled to the carriage and pushing on the
5 guide such that the motor when energized moves with the carriage along the guide.
- 1 2. The actuator of claim 1, wherein the motor comprises a base and a
2 beam of piezoelectric material attached to the base, the base of the motor connected
3 to the carriage and a free end of the beam pushing on the guide.
- 1 3. The actuator of claim 1, wherein the motor is attached to the carriage.
- 1 4. The actuator of claim 1, wherein the motor is biased against the guide.
- 1 5. The actuator of claim 1, further comprising a spring coupled between
2 the carriage and the motor to urge the motor against the guide.
- 1 6. An actuator, comprising:
2 a stationary guide;
3 a piezoelectric motor pushing on the guide; and
4 a carriage at least partially surrounding the motor and movable back and forth
5 along the guide at the urging of the motor.
- 1 7. A head carriage and actuator assembly, comprising:
2 a stationary guide;
3 a carriage movable along the guide;
4 a head carried by the carriage; and
5 a piezoelectric motor attached to the carriage and pushing on the guide such
6 that the motor when energized moves with the carriage along the guide.

1 8. A head carriage and actuator assembly, comprising:
2 a stationary guide;
3 a carriage movable along the guide;
4 a head carried by the carriage; and
5 a piezoelectric motor attached to the carriage opposite the head such that the
6 guide lies between the head and the motor, the motor comprising a base attached to
7 the carriage and a beam of piezoelectric material attached to the base, a free end of
8 the beam pushing on the guide.

1 9. A head carriage and actuator assembly for a tape drive, comprising:
2 a first guide rail;
3 a second guide rail spaced apart from the first guide rail;
4 a carriage supported on and movable along the first and second guide rails;
5 a magnetic head carried by the carriage, the head positioned adjacent to the
6 first guide rail opposite the second guide rail such that the first guide rail lies between
7 the head and the second guide rail; and
8 a piezoelectric motor attached to the carriage and operatively coupled to the
9 first guide rail such that the motor when energized moves with the carriage along the
10 guide rails.

1 10. The actuator of claim 9, wherein the motor comprises a base and a
2 beam of piezoelectric material attached to the base, the base of the motor attached
3 to the carriage and a free end of the beam pushing on the first guide rail.

1 11. The actuator of claim 9, wherein the motor is attached to the carriage
2 between the first guide rail and the second guide rail.

1 12. The actuator of claim 9, wherein the carriage surrounds the motor.

1 13. A head carriage and actuator assembly, comprising:
2 a stationary guide;
3 a carriage movable along the guide;
4 a head carried by the carriage; and

5 a stationary piezoelectric motor pushing on the carriage such that the motor
6 when energized moves with the carriage along the guide.

1 14. A tape drive, comprising:
2 a take-up reel;
3 a stationary guide;
4 a carriage movable along the guide;
5 a head carried by the carriage;
6 a tape path extending past the head to the take-up reel;
7 a piezoelectric motor attached to the carriage and pushing on the guide such
8 that the motor when energized moves with the carriage along the guide; and
9 an electronic controller configured to receive read and write instructions and
10 data from a computer or other host device and to control operation of the take-up
11 reel, the actuator and the head.

1 15. The tape drive of claim 14, wherein the controller is configured to
2 position the head according to the following method:
3 stopping the carriage at a known position;
4 the motor moving the carriage a first step from the known position;
5 counting the step;
6 comparing the step count to a target step count;
7 if the step count is less than the target step count, the motor moving the
8 carriage another step; and
9 repeating moving, counting and comparing until the step count is equal to the
10 target step count.